Space Weather Forecast

Issued on Friday, 23 December 2022 at 13:30 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

Space Weather Forecast Headline: Slight chance of Moderate-class flares and G1/Minor geomagnetic storms throughout.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Low, with several minor Common-class flares. There are currently 7 sunspot regions on the visible disc, two of which are modestly large and complex. All other regions appear small and simple at the present time.

No Earth directed coronal mass ejections were observed in available imagery during the period, though a filament eruption in the southwest has been ongoing at the time of writing and will be assessed once imagery is available.

Solar Wind / Geomagnetic Activity: The solar wind was indicative of a transition into a weak High Speed Stream, likely from coronal hole 55. Wind speeds rose from slightly elevated to elevated. The total interplanetary magnetic field has been weak to moderate, varying between weakly positive and weak to moderately negative. Resultant geomagnetic activity was Quiet to Unsettled (Kp 1-3), with an Active (Kp 4) interval 23/0000-0300 UTC.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) remained at background levels with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is likely to remain Low, with occasional Common-class flares. There remains a slight chance of Moderate-class flares throughout the forecast period, due to current Earth-facing spot groups and as departing spots are anticipated to be replaced by new regions from the far side.

Solar Wind / Geomagnetic Activity: A coronal mass ejection may give glancing impacts early 24th. There have also been numerous flares and peripheral coronal mass ejections recently and thus further transients cannot be ruled out. Solar winds are forecast to be slightly elevated or elevated through the period due to ongoing coronal hole high speed stream effects.

Quiet to Unsettled geomagnetic activity is most likely, with spells of Active. There is a slight chance of G1/Minor storms throughout, most likely as Earth transitions to the HSS from CH56 later on Day 1 or early on Day 2 (23-24 Dec) and again on Day 4 (26 Dec) with the HSS from the unnumbered coronal hole.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is expected to persist at background levels, with no solar radiation storms expected.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	20	20	15	20
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	20	20	20	20
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	5	5	5
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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